UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,677	09/28/2001	Kiyoshi Yajima	040894-5726	3489

9629 7590 07/19/2005	EXAMINER	
MORGAN LEWIS & BOCKIUS LLP	SKED, MATTHEW J	
1111 PENNSYLVANIA AVENUE NW		
WASHINGTON, DC 20004	ART UNIT	PAPER NUMBER
	2655	

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>02 May 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-9</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05/02/05</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   The objection to the drawings is withdrawn in view of the amendment filed

05/02/05.

2.   The objection to the specification is withdrawn in view of the amendments filed

05/02/05.

3.   Applicant's arguments with respect to claims 1-9 have been considered but are

moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1-3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hirayama (U.S. Pat. 5,854,999).

As per claim 1, Hirayama teaches a voice recognition system comprising:

a standard acoustic model having a standard vector generated according to

information on voice (reference pattern, Fig. 4 element 30);

a first feature vector generation section for reducing noise from an input signal

generated from an uttered voice (analyzer provides an input pattern to the matching

section, Fig. 4, elements 10 and 20);

a second feature vector generation section for generating a second feature

vector from the input signal having the noise (analyzer provides an input pattern to the

compensatory value calculator, Fig. 4 elements 10 and 40); and

a preparation section for generating an adaptive vector based on the first feature

vector, the second feature vector and the standard vector, and preparing a speaker

adaptive acoustic model suitable for the uttered voice (compensatory value calculator

calculates compensatory values to compensate the reference pattern to create a

compensated reference pattern, col. 9, lines 13-39 and Fig. 4, elements 40 and 50).

Hirayama does not specifically teach or point out having the user generate the

input signal corresponding to a designated text.

However, the Examiner takes Official Notice that it is common in the art to train a

speech recognition system by having a user speak designated text. Therefore, it would

have been obvious to one of ordinary skill in the art at the time of invention to modify the

system of Hirayama to have the user generate the input signal corresponding to a

designated text because it would allow the system to obtain the corresponding standard

vector without a lengthy matching process hence having a faster adaptive process and

so having more accurate speech models corresponding to the user's environment.

6.   As per claim 2, Hirayama teaches the preparation section compares:

the first feature vector with the standard vector to obtain a path search result

(primary matching section computes the distance between the input pattern and the

reference pattern, col. 9, lines 13-39); and

the preparation section coordinates the second feature vector with the standard

vector according to the path search result to generate the adaptive vector

(compensatory value calculator determines the compensatory values based upon the

second feature vector, standard vector and path result, Fig. 4, element 40).

7.   As per claim 3, Hirayama teaches the noise includes additive and multiplicative

noise (system the current system is based upon compensates the system for additive

and multiplicative noise, col. 3, lines 28-34).

8.   As per claim 9, Hirayama teaches the second feature vector generation section

applies at least cepstrum calculation to the input signal to generate the second feature

vector (analyzer performs Mel-Cepstrum analysis, col. 9, lines 39-45).

9.   Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hirayama in view of Shozakai et al. ("A non-iterative model-adaptive E-CMN/PMC

approach for speech recognition in car environments"), cited by the applicant.

As per claims 4 and 5, Hirayama teaches applying a transformation to the input

signal to generate a first spectrum (col. 9, lines 39-45).

Hirayama does not teach the first vector generation section includes an additive

noise reduction section for reducing the additive noise from the input signal to generate

an additive-noise reduced signal by subtracting an additive noise spectrum

corresponding to the additive noise from the first spectrum.

Shozakai teaches the additive noise reduction section applies a transformation to

the input signal to generate a first spectrum and subtracting an additive noise spectrum

corresponding to the additive noise from the first spectrum (spectrum subtraction, page 1, col. 1, lines 32-38).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Hirayama to include an additive noise reduction section for reducing the additive noise from the input signal to generate an additive-noise reduced signal by subtracting an additive noise spectrum corresponding to the additive noise from the first spectrum as taught by Shozakai because it would provide a noise reduced signal to the path searching section hence providing a more accurate path search result.

10.   As per claim 6, Hirayama teaches a cepstrum calculator for applying cepstrum calculation to input (col. 9, lines 39-45).

11.   As per claims 7 and 8, Hirayama teaches the first feature vector contains a plurality of time-series feature vectors (temporal series of vectors, col. 9, lines 39-45).

Hirayama does not teach a multiplicative noise reduction section for reducing the multiplicative noise by subtracting the multiplicative noise from the first feature vector and calculates a time average of the time-series first feature vectors for estimating the multiplicative noise.

Shozakai teaches the first feature vector generation section includes a multiplicative noise reduction section for reducing the multiplicative noise by subtracting the multiplicative noise from the first feature vector (the E-CMN method performs cepstrum mean normalization, page 2, col. 1, lines 7-17) and the multiplicative noise reduction section calculates a time average (long-term average) of the time-series first

feature vectors (short term spectra) for estimating the multiplicative noise (multiplicative noise is modeled by finding the long-term average over the short term spectra, page 1, col. 2, lines 6-9).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Hirayama to have a multiplicative noise reduction section for reducing the multiplicative noise by subtracting the multiplicative noise from the first feature vector and calculates a time average of the time-series first feature vectors for estimating the multiplicative noise as taught by Shozakai because it would provide a noise reduced signal to the path searching section hence providing a more accurate path search result.
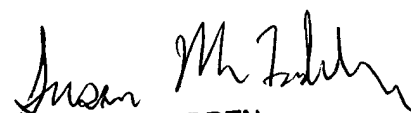
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

MS
07/12/05

SUSAN MCFADDEN
PRIMARY EXAMINER